

Contribution of Nonmarket Works In Bangladesh Considering Educational Qualification and Sex Issues: An Opportunity Cost Analysis

Dr. Md. Aoulad Hosen

Department of Economics (Social Science Group), Chairman & Associate Professor, National University, Gazipur – 1704, Bangladesh.

Abstract: Nonmarket works (NMWs) are always undermined by the usual market evaluation process. Considering the basic idea of value generation the NMWs produce significant (384.79 billion labor hours, studied by author) value in Bangladesh. The economically inactive people are the main source of labor force of the NMWs. The problem of conventional measure fails to recognize the value of the NMWs. This paper considered the contributions of the females (from sex issue) and the graduates (from qualification issue) to produce NMWs. To determine the monetary appraisal of the NMWs an opportunity cost method was employed accompanied by a precise methodology. A distinct theoretical framework, primary data and some case studies were the sources of facts. In each separate model this study uncovered that the graduates and the females produced NMWs of the value intake three thousand five hundred and ninety four per person/month and take two thousand five hundred eighty eight per person/month respectively. Considering both the variables in a collective model, these figures were tk. 3361.08 per person/month and tk. 2466.03 per person/month.

Keywords: Nonmarket works, labor force, conventional measure, market evaluation, opportunity cost.

I. Introduction

Traditional economic statistics, particularly the national income accounts and the employment measures are designed mostly to measure the market economy. It excludes most of the non-market productive activities (i.e. NMWsⁱ) inside and outside the household. However, knowledge of the household labor, unpaidⁱⁱ and underpaidⁱⁱⁱ work, is becoming increasingly significant for public policy decision making now-a-days. NMWs refer to those activities in the economy which contribute to our economy, but the measure of which cannot be evaluated by the general conventional framework. According to Mankiw [1], the simple and fundamental theoretical concept of *circular flow*^{iv} ensures a continuous interaction between producers and consumers. The interaction between these two parties occurs through two market frameworks: the goods market and the factor market. Here, these two markets mainly justify the economic values of goods and services generated by producers and consumers. Some kinds of work like collecting water, cleaning and taking care of the house, washing clothes, washing dishes, cooking and serving meals, taking care of children, taking care of the sick and the elderly care, gleaning crop, etc. which produce significant values in terms of utility but cannot be evaluated by the conventional market structure. Such work can be mentioned as non-market work (NMW). The evaluation of the value of product depends on some characteristics of market structure, such as the number of buyers and sellers, the quality of product, consumers' and producers' knowledge of the product, mobility of the factors of production, the degree of government intervention, etc. among others. But there is no scope to evaluate or justify the value of the NMWs. Researchers, policy makers or even common people cannot overlook the significance of the above-mentioned NMWs. Therefore, attention is required to evaluate the NMWs and a new method of estimation is necessary to be considered as an alternative tool of market evaluation.

II. Research methodology

2.1 Objective: The research shares out on the NMWs of the unemployed and underemployed female and graduate who are engaged in generating the value (use value) working in households, outside the households sector and informal sectors. The main objective is to estimate the explanatory variables of NMWs. To know the impact producing NMWs, female from the sex issue and graduates from the educational qualification issue were considered as the independent variables were taken into consideration. The objectives are –

2.1.1 To find out the level of contribution to NMWs by the females and graduates as individual groups.

2.1.2 To find out the extent of contribution to NMWs by the females and the graduates together.

The methodology of the research was based on the following three steps:

2.2 Sample: In the first step, sample covered sampling technique, questionnaire design and data collection:

2.2.1 Sampling technique: Random sample technique was used. Random sampling is the purest form of probability sampling. All such subsets of the frame were given an equal probability.

2.2.2 Questionnaire design: A questionnaire to do the research requires to care (a) personal information, (b) family information, (c) 24 hours activities including market works, non-market works, leisure, etc. and (d) personal evaluation about the NMWs. This research would like to consider the personal and family information including academic qualification, experience, age, profession, marital status, etc. and recognize the NMWs and its duration a day. All types of partial benefits provided against the NMWs in terms of food, shelter and clothes are intended to be identified by asking questions. Some case studies are also gathered to find real picture of NMWs.

2.2.3 Data collection: This study is mainly based on primary data. The primary data sources cover some rural and urban areas in Bangladesh while the secondary data sources involve the direct market work area. Data was collected from Dhaka and Gazipur districts. To accommodate various NMWs, three types of sample locations were considered: i) urban, ii) rural and iii) semi urban or semi-rural (mixed sample areas). This research found about four respondents out of five i.e. the response rate was about 80 per cent.

Table 01: Study places and number of samples

	Gazipur					Tongi, Gazipur					Dhaka																		
L	J	H	J	T	K	K	D	N	T	M	M	M	M	M	M	P	G	K	D	I	M	D	B	U	D	U	F	T	
o	a	a	a	o	a	a	h	a	u	i	i	i	i	i	i	o	a	a	u	b	o	h	a	r	t	a	t	r	o
c	m	r	y	i	a	a	o	y	r	r	r	r	r	r	l	b	y	a	r	a	h	a	r	i	B	a	n	a	t
a	u	n	e	k	p	a	r	a	a	p	p	p	p	p	l	t	l	a	r	i	m	n	a	is	m	r	a	s	t
t	a	a	p	u	a	r	a	a	r	r	r	r	r	r	o	o	n	p	a	p	o	n	k	h	o	n	a	C	o
i	a	a	p	u	a	r	a	a	r	r	r	r	r	r	o	o	n	p	a	p	o	n	k	h	o	n	a	C	o
n	l	l	p	l	a	r	a	a	r	r	r	r	r	r	o	o	n	p	a	p	o	n	k	h	o	n	a	C	o
N	1	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1
o	2	3	1	4	5	1	1	1	3	8	2	2	4	3	4	7	1	1	1	5	1	4	1	1	1	1	1	1	0
s																													0

Source: PhD Field work, April-August, 2009, Hosen, [2]

2.3 Instruments: To avoid the difficulty of estimation of NMWs the following estimation procedures and opportunity cost method were examined:

2.3.1 Estimation procedures: The respondents were asked to fulfill a questionnaire having three parts: household NMWs, NMWs outside the household and NMWs before employment. Among the three categories, different types of NMWs are included. In the questionnaire, some blank spaces were kept to accommodate some unfamiliar NMWs. Besides this reason, the name of the NMWs cannot be mentioned as the name of formal works. We also know that, the name of one single NMW can be identified differently in different locations. Workers were to choose their part and mention the names of the NMWs, duration of the NMWs and to mention whether receivable anything against the NMWs. A sample survey (Hosen [3]) found 16 describe (mention as 1 to 16), 17 (mentioned as 21 to 37) and 06 (mention as 41 to 46) NMWs which represent the three categories of household NMWs, outside NMWs and NMWs before employment respectively. The secondary data sources involve the direct market work area (BBS study 2009[4], 2008a[5], 2008b[6], 1996a[7]), the study was reexamined the current sources of data of the conventional national income estimate adopted by BBS.

2.3.2 Applied opportunity cost method: Opportunity cost (OC) method was considered as a major tool to estimate the value of the NMWs. The study (BBS, 2008b) was taken into account as the standard to convert the value of NMWs. To determine an actual or a proper wage earning, OC method becomes a potential tool to explore the return of input of an economy. This research identified three opportunities of a respondent: the level of education, sample areas (i.e. where a respondent is living) and age (i.e. how older of a respondent). Each opportunity of a respondent gives a window to evaluate an individual according to their scope, scale and skill. Three variables were considered to estimate OC method; they included educational qualification (w1), sample area (w2) and age (w3). These three variables were individually judged for each respondent. To judge each variable for each respondent, the other two variables were kept constant. Finally, OC was derived from the average value of w1, w2 and w3 according to the following formula: $W = (w1+w2+w3)/3$.

2.4 Procedure for better understanding: To evaluate the value of NMWs of female and graduate some econometric models were developed, exercised and analyzed for the better understanding in findings area. Among the different variables^v of the NMWs, the contribution (hourly) of NMWs made by female and graduate were characterized as explanatory variables and their final monetary returns recognized as explained variable. To know estimates and the monetary value of NMWs this study was exercised a linear regression technique to evaluate the relationship among the respective variables through the economic models (koutsoyiannis [8]). Here, a set of econometric models were exercised under the linear regression technique SPSS (15.0 for Windows Evaluation Version. Ink), MS-Excel, Power Point and MS-word (Office 2007) computer software were employed.

III. Theoretical framework

Non-market production covers the goods and services of the household members and the productions for their own consumption, and combines their unpaid labor and, in some cases, the goods and services they acquire on the market (Chadeau, [9]). Hamdad [10] defines household work as the goods and services resulting from such activities. He terms it as a source of utility to the members of the household and as a contribution to their well-being. "Women are low paid, because they have low education, few market linkages, and low access to raw materials" (Das [11]). Quoted the views of Folbre [12] for the necessity of the NMWs of women as

"With the advent of global women's movements the next sequel to the debate over NMW was the need to reflect women's contribution in every relevant aspect of production. It was, therefore, proposed that household activities should be analyzed not only in economic terms, such as risk and uncertainty, but also that the micro-economic analysis of a household should be situated within a large structural analysis to encompass gender and age based inequalities and their interaction with class structure and national position within the world capitalist system".

Any estimate of *economic value*^{vi} in terms of the conventional market framework can be questioned to be gender biased. Gender bias in economic measures is particularly alarming because of the important role it holds in formulating public policy. Without any official measure of the NMWs, the current economic indicators give an incomplete, incorrect image of well-being since it does not account for a significant amount of work. Researchers (Hart [13]), mainly economist (Kabra [14]) argue that the keeping out of the NMWs from the economic accounts is due to the complexity in estimating its value. However, this is hardly a believable explanation, given the guesswork involved in imputing the value of other components of GDP as well. In a society where value is measured by monetary perspectives, some researchers and feminists (MacPhail & Dong [15], Hamid [16], Hamdad 2003, Folbre [17], Domingo [18], Budlender [19], et al.) have recommended that women's work should be included in the GDP. In our modern life, the way of valuation in terms of money (usual pricing theory/method), Hyman [20] and Case & Fair [21] were considered to be a good judgment process. Moreover, it is then easy to compare the numerous services being produced regularly in our society.

Regarding the allocation of time between men and women in the work place, women enjoy less time for leisure than their male counterparts (UNDP, [22]). Thus, women's ability to use their employment to negotiate more favorable outcomes in household may be constrained by the overarching patriarchal system of gender-based social norms which vary by location. Household works never come one after another; that is, the patterns of these works do not follow any sequential manner. A woman, sometimes, has to be engaged in even more than one activity. The most noticeable research (Chakraborty [23]) finding on time utilization was that women have many tasks that are of nonstop nature and that they usually take on more than one piece of work at the same time. Depending upon the age of the kids, cleaning, feeding and teaching good behavior take uneven lengths of time. Women who breastfeed their children are noted to spend up to 5 hours of work per day after it (Kramer and Kakuma [24]). Several women had children with health and behavioral problems and this caused substantial amounts of additional work and time, and often other things such as cleaning would get sacrificed in the process. In general, cleaning and cooking occupied 6 to 8 hours of a day. The pieces of work that were often referred to in this regard involved preparing food, doing laundry, providing children with recreation time, dealing with schools, social workers and attending medical appointments.

IV. Bangladeshi perspective on non-market works

The estimate of GDP on non-market activities is yet to find a complete shape. Some researchers have been done on women household work (Hamid [25]) where 53% of non-market productions of women were identified. This research defines market work, non-market activities and house works and uses a few tools (such as opportunity cost, informal wage) for the estimate. From the study of 'Non-market work and national income: the case of Bangladesh', she argues that housework should be redefined as the economic services produced by household members. The study was obtained some new dimension of the concepts of work, market work, and NMW here. Rahman [26] states that, the usual practice in Bangladesh and other countries are to include all 'economic' activities and to exclude 'domestic work'. He argues that domestic work be harmful for children's

national activities. As the practical approach of child labor, he considered 'economic activity' criterion that is paid work. Bayes and Hossain [27] contend that the average working of women hour is higher than that of men at present. Two causes can be identified behind this fact: firstly, reduction of birth rate made a scope to give less time for child care, and secondly, the use of new technologies in agriculture sector reduces cumbersome participation of female and it ensured cost saving as well. This study, however, did not incorporate the informal works or the NMWs of women. If they did, the working hours of women would definitely be higher than that of men. The contribution of women in the NMWs, especially in the household is substantial (Hamid). To find the status of women from economic point of view, it requires concentrating on the household status by domestic labor time, responsibility for domestic tasks, and household decision-making. In terms of these perspectives, it can be assessed that women in Bangladesh enjoy lower household status than men.

The structure of the Bangladeshi economy changed gradually over the last 3 decades. According to the study of the Bangladesh Bureau of Statistics (BBS, 2010^{vii}) about 40.7% people are economically inactive. The volume of female labor force (13.5 m.) was much smaller than that of the males (40.2m.), and the volume of the absentees in the labor force for female was larger than that of males. In addition to the youthful age structure of the population, the low level of the female activity rate was due to, among other things, the conception that women's principal role consider is to perform domestic works.

V. Significance of the study

Monetary practices and return makes us to understand about the individual contribution of our society. But beyond the monetary return huge goods and services are producing (NMWs) and contribute to the people in all over the world especially labor surplus countries like Bangladesh. The producers of NMWs have been undermined due to the lack of comprehensive method of estimation against their value of NMWs. Societies or even families are not habituate to acknowledge them accordingly in terms of their status, position, empowerment, decision making role and so on. This research tries to explore the proper contribution and understanding of those people producing NMWs through monetary justification and estimation of NMWs as well.

VI. The importance of the different method (satellite accounts)

The impact of a system of *satellite accounts*^{viii} of national income could be enormous, which means helping to provide an accurate accounting of essentially very private matters for crucial public purposes. According to Landefeld, Fraumeni and Vojtech [28] "Such accounts would allow for experimentation with changes in scope and measurement for national accounts in the form of supplementary accounts. These accounts would be consistent with and could be used with the existing national accounts without diminishing the usefulness of the core accounts". Which one is more important in human life, productivity or standards of living? While development policies are generally geared to increase productivity, increases in productivity are not necessarily reflected in increases or improvements in standards of living. In the industrialized countries, for instance, there are questions about the real benefits of full-time employment for mothers in the absence of adequate child-care arrangements and/or more sharing of household responsibilities by fathers. In the developing countries, living standards may actually deteriorate while GDP rises.

VII. Measure of unpaid work and UN guidelines

The United Nations Development Program's Human Development Report (UNDP [29]) gives the most recent and significant political momentum to measure women's unpaid work. The report investigates about the rising inequality of opportunity between different people and nations. It was released before the United Nation's Fourth World Conference on Women held in Beijing, China. It declares that investing in women's capabilities and empowering them to exercise their choices is not only valuable in itself, but also is the surest way to contribute to the economic growth and overall development. Under the Beijing Declaration and Platform for Action's section on Institutional Mechanism for the Advancement of Women, *strategic objective H.3, item 206* (See, **Appendix 01**, for more) asks the national, regional and international statistical services and relevant governmental and United Nations agencies, in cooperation with research and documentation organizations, to generate and disseminate gender-disaggregated data and information for planning and evaluation. This call-to-action has led to local efforts to document women's NMWs and work towards valuing women's unpaid work.

VIII. Labor force structure and scope of NMWs

The underemployment rate of the females is more than that of the males, both in the urban and the rural areas. Similar scenario prevails in the unemployment rates of the males and females also. According to the surveys of MES^{ix} and LFS^x over 10 million people did nothing in terms of economic point of view; they were recognized as 'unpaid family helper'. Of about 41.5% people who were not in the labor force (i.e. economic structure, cannot be accommodated them) females secured over 70%. In the category of outside the labor force,

the position of household holds as huge as 68.7%, while rest the two categories, student and others, hold 18.7% and 12.6% respectively. Again, inside the household, females provided over 80% time which was completely unacknowledged and untapped by the conventional economic framework. So, among the different variables of NMWs female and graduate contribution were considered to determine the value of the NMWs.

Table 02: Percentage distribution of population aged 15 years and above by economic category 2005-06.

Economic category	Both Sex	Male	Female
Population aged 15+(million)	84.6	43.0	41.6
Total	100.0	100.0	100.0
Labour Force	58.5	86.8	29.2
Not in Labour force	41.5	13.2	70.8
Total Labour Force	100.0	100.0	100.0
Employed	95.8	96.7	93.0
Unemployed	4.2	3.4	7.0
Not in Labour Force	100.0	100.0	100.0
Household Work	68.7	6.2	80.8
Student	18.7	65.4	9.6
Others	12.6	28.4	9.6

Source: BBS (2008a), Key findings of Labor force Survey 2005-06, pp. 6, (modified Table 02)

IX. Analysis of data and presentation of findings:

To unearth the monetary contribution of the females and the graduates, three models were exploited. The first two models separately examined the economic value of the NMWs of the females and the graduates, while the third model concentrated on estimating the joint contribution regarding the value of the NMWs. Each model employed linear regression analysis through SPSS software. The models are:

Model 1: $TVNMWOC = a + b EQD6 + e1$

Model 2: $TVNMWOC = c + d SEX + e2$

Model 3: $TVNMWOC = f + g SEX + h EQD6 + e3$

Where,

TVNMWOC = Total Value of NMWs by Opportunity Cost

a = c = f = Intercepts

b = d = g = h = Coefficient (Slopes)

e1 = e2 = e3 = Stochastic Disturbance Terms

EQD6 = Educational Qualification on Graduate level, as a Dummy Variable, EQD6: graduate=1, 0=otherwise

Expected sign of EQD6 = positive, that is, an additional hourly contribution of a graduate was enhanced the monetary value of NMWs.

SEX = Sex, as a Dummy Variable, SEX: Female (f) = 1, male (m) = 0

Expected sign of SEX = positive, that is, an additional hourly contribution of a female/male was improved the monetary value of NMWs.

9.1 Result of model 1

$TVNMWOC = 2042.95 + 1551.46 EQD6$

Std. Error {216.52} {721.7} df = 98, $F_{1,98} = 4.621$

t value [9.43] [2.15]

signi. (.000)(.034)

Among the different explanatory variables, EQD6 played a vital role to produce the NMWs by OC method. In the job market, the opportunity cost of a graduate seems to be more capable to work than non-graduate people (all level of undergraduate). This model examined that the dummy variable of EQD6 and dependent variable TVNMWOC are positively related with each other i.e. expected sign was established. The both coefficients (.000 & .034) were highly significant. 'In language of significance tests, a statistic (t-test) is said to be statistically significant if the value of the test statistics lies in the 'critical region' (Gujarati [30]). So the 't-values' were justified. The estimated value of a graduate person work was found to be tk. 3594^{xi} per month, while tk. 2043 per month was produced by the non-graduate people (when EQD6 = 0). As a labor surplus country, the labor force structure of Bangladesh recognized that 41.5 millions of people are not in the labor force. Of the total labor force, about 69 per cent people were working in the household (Table 02). The contribution of these people mostly inclined to produce NMWs. Although the regular markets were failed valuing NMWs of graduate but the OC method and the analysis of the model appraised the monetary involvement (See Appendix 2, for more).

9.2 Result of model 2:

TVNMWOC = 1922.92 + 665.8 SEX
Std. Error {267.34} {428.1} df = 98, $F_{1,98} = 2.419$
t value [7.2] [1.55]
signi. (.000)(.123)

The result of the model showed that the explanatory variable SEX and the explained variable TVNMWOC are positively related with each other i.e. the expected sign and relationship were found. It can be assessed that the coefficient of constant was significantly well (.000) and also acceptable with 't-value' and coefficient of SEX variable was moderately significant (little higher than 10% level). From the characteristics of dummy variable, female and male participation regarding the NMWs and their monetary value can be found out through OC method. To consider the monetary value, the study explored that each female contributed tk. 2589^{xii} per month, while the each male contributed tk. 1923 per month (when SEX = 0). Some factors like family responsibility, having more time in hand than males, social custom, religious matter etc. induced the females to deliver more NMWs but the importance of female contribution every so often misjudged due to proper value of NMWs. These monetary contributions explore a new window to think differently and possess the recognition from family and society as well. (See Appendix 3, for more).

9.3 Result of model 3:

TVNMWOC = 1766.03 + 700.00 SEX + 1595.05 EQD6
Std. Error {271.39} {419.97} {715.77} df = 97, $F_{1,97} = 3.741$
t value [6.51] [1.67] [2.23]
signi. (.000)(.099)(.028)

In the collective model both explanatory variables of NMWs were considered. The model here showed that the expected sign found regarding both explanatory variables and the level of significance rather well including intercept. In the three cases 't-values' were justified, only the 't-value' of SEX was little lower than the benchmark. It is found here that the female group and graduate group produced 2466.03^{xiii} per person/month (when EQD6 = 0) and 3361.08^{xiv} per person/month (when SEX = 0) respectively. On the other hand, the collective contribution was 4061^{xv} per person/month. Among the three models, statistical analysis ensured the valuable economic contributions of NMWs produced by female and graduate. (See Appendix 4, for more)

X. Conclusion and future research

A huge amount of labor force cannot be figured out through the regular procedure of estimation (Hosen [28]), though our economy has been recognized to have a labor surplus. The statuses of the people who produce the NMWs are always undermined by the families and society because they cannot get economic return against their NMWs. In most of the cases, people who engage in NMWs are not properly evaluated by the family or the society. So, the value judgment of the NMWs will draw benefit in terms respect, dignity, status, etc. for the most of the people in individual families as well as for the mass people in the society.

A family has a huge load of household tasks. In most of the cases, women have taken cumbersome loads in the household, which include child care, elder care, cooking, cleaning etc. But the economic return of women against their market work and the NMWs is misjudged through market framework. Though, an unemployed graduate has some extra tasks for him/herself and for his/her family, the regular market framework recognizes them as unemployed. On an average, a graduate produces tk. 3594.41 per month, while a female contributed tk. 2588.72 per month. In the common model these contributions were tk. 3361.08 and tk. 2466.03 respectively, which were very near to the outcomes of the first and the second model. Author assumed that increases in female employment and wages will automatically translate into welfare. Female employment requires quality and sufficient education. An educated woman can better contribute to the betterment of the family. The family responsibility of a woman is purely linked with the NMWs. It should be evaluated by the economy and society as well.

There are lots of scopes to work in that field. Author found that, a significant number of unemployed people are producing NMWs and on the other hand, a huge number people derived from informal sector are also working to produce NMWs. These surplus people somehow engaged in NMWs to produce goods and services. A proper attention and extra care is required to estimate the value of NMWs due to this uneven characteristic. It is pertinent for further research about the close monitoring of NMWs, regular evaluation of NMWs and estimate in time basis such as quarterly, half yearly and yearly. Some special institutes, like BBS, are required to set up to observe the working hours, pattern of works regarding NMWs. In regular basis, these bodies can collect data about the different perspective of NMWs from all over the country considering sixty four districts. Cluster random technique could be helpful for do the same. To know the real value of NMWs these bodies play vital role through monitoring, evaluation and estimate the value of NMWs. New research initiative will enrich the value GDP in terms of market works and NMWs.

Appendix 01:Strategic objective H.3. Generate and disseminate gender-disaggregated data and information for planning and evaluation

Actions to be taken: (Abridge version)

206. By national, regional and international statistical services and relevant governmental and United Nations agencies, in cooperation with research and documentation organizations, in their respective areas of responsibility:

- i. Ensure that statistics related to individuals are collected, compiled, analyzed and presented by sex and age and reflect problems, issues and questions related to women and men in society;
- ii. Collect, compile, analyze and present on a regular basis data disaggregated by age, sex, socio-economic and other relevant indicators, including number of dependants, for utilization in policy and program planning and implementation;
- iii. Involve centers for women's studies and research organizations in developing and testing appropriate indicators and research methodologies to strengthen gender analysis, as well as in monitoring and evaluating the implementation of the goals of the Platform for Action;
- iv. Designate or appoint staff to strengthen gender-statistics programs and ensure coordination, monitoring and linkage to all fields of statistical work, and prepare output that integrates statistics from the various subject areas;
- v. Improve data collection on the full contribution of women and men to the economy, including their participation in the informal sector(s);

Appendix 02:Table 03: Coefficients of Model 1

Model 1	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	2042.947	216.525		9.435	.000
Educational qualification, EQD6:graduate=1, 0=otherwise	1551.460	721.749	.212	2.150	.034

Source: SPSS data analyzed by Author. a Dependent Variable: Total value NMW for consider OC (monthly), (works - support)

Appendix 03:Table 04: Coefficients of Model 2

Model 2	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	1922.915	267.346		7.193	.000
SEX, m=0,f=1	665.802	428.096	.155	1.555	.123

Source: SPSS data analyzed by Author.ADependent Variable: Total value NMW for consider OC (monthly), (works - support)

Appendix 04:Table 05: Coefficients of Model 3

Model3	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta	B	Std. Error
(Constant)	1766.025	271.386		6.507	.000
SEX, m=0,f=1	699.996	419.968	.163	1.667	.099
Educational qualification, EQD6:graduate=1, 0=otherwise	1595.050	715.767	.218	2.228	.028

Source: SPSS data analyzed by Author. ADependent Variable: Total value NMW for consider OC (monthly), (works - support)

References

- [1]. Mankiw, G. N. Principles of economics,2nd Ed. Orlando, FL 32887-6777, Philadelphia: Harcourt College Publishers, Harcourt Inc. (pp. 23 & 398-407), 2006.
- [2]. A. Hosen, "Individual Worth vs. Aggregate Value: Influential Factors of Non-Market Works (NMWs) in Bangladesh", The Global Journal of Management and Business Research. Vol. 12, Issue 2, Version 1.0, 2012.
- [3]. [Online] Available: https://globaljournals.org/GJMBR_Volume12/11-Individual-Worth-vs-Aggregate-value.pdf
- [4]. A. Hosen, Estimating Nonmarket Activities: A Study on Unpaid and Underpaid Labor Force in Bangladesh, A. Muhammad, and A. T. M. N. Amin, (Eds), National University, Bangladesh, 2011.
- [5]. Bangladesh Bureau of Statistics, Monthly Statistical Bulletin-Bangladesh, Dhaka: BBS, (2009).
- [6]. Bangladesh Bureau of Statistics,Key Findings of Labor Force Survey 2005-06, BBS, Dhaka: Government of the People's Republic of Bangladesh, 2008a.
- [7]. Bangladesh Bureau of Statistics, Key indicators From the Wage Survey-2007, measurement and valuation of unpaid contribution: accounting through time and output, Dhaka: BBS, 2008b.
- [8]. Bangladesh Bureau of Statistics, Report on Labor Force Survey of Bangladesh (1995-96), BBS, Dhaka: Government of the People's Republic of Bangladesh, 1996a.
- [9]. A. Koutsoyiannis, Theory of Econometrics, 2nd Ed. Hampshire RG21 2XS: The Macmillan Press Ltd. pp. 48-99, 1993.
- [10]. A. Chadeau, "What is households' non-market production worth?" OECD Economic Studies. No. 18,pp. 86-102, 1992.

- [11]. M. Hamdad, Valuing households' unpaid work in Canada, 1992 and 1998: Trends and sources of change, Ottawa: Statistics, Canada Economic Conference, 2003.
- [12]. M. B. Das, "The other side of self – employment: house enterprises in India", Social Discuss Paper Series, No 0318, New York. The World Bank, 2003.
- [13]. N. Folbre, "Cleaning house, new perspectives on households and economic development" *Journal of Development Economics*, 22 (1985) 5-40 North – Holland, 1986.
- [14]. K. Hart, Perspectives on Informal Economy, 1997. [Online] Available: http://www.encyclopedia.com/topic/Informal_Economy.aspx.
- [15]. K. N. Kabra, "The Informal Sector: A Reappraisal" *Journal of Contemporary Asia*, v25, n2: 197- 32, 1995.
- [16]. F. MacPhail, and X. Y. Dong, Women's market work and household status in rural china: evidence from Jiangsu and Shandong in the late 1990s, Mortimer Street, London: Online Publication, Feminist Economics, 2007.
- [17]. S. Hamid, "Non-market work and national income: The case of Bangladesh", *The Quarterly Journal of the Bangladesh Development Studies*, Dhaka. Vol. XXI, Nos 2, 3, 1994.
- [18]. N. Folbre, *The invisible heart: Economics and family values*, New York: The New Press, 2001.
- [19]. S. Domingo, The feminist valuing the devalued process, *Instraw/ser.b/47: Gains Net*, created by: Alexis Frank, Shaheli Guha, Hitomi Yoneya, 1995. [Online] Available: <http://heinonline.org/HOL/LandingPage?collection=journals&handle=hein.journals/tlcp8&div=21&id=&page=>
- [20]. D. Budlender, *Why should we care about unpaid care work?*, Mauritius, Harare: Frontline Electronic Publishing (Pvt.) Ltd: Southern Africa and Indian Ocean States. 2004.
- [21]. Hyman, D. N. (1997). *Microeconomics*. (4thed.). Boston, Massachusetts: Irwin/McGraw-Hill, pp. 101-122.
- [22]. K. E. Case, and C. R. Fair, *Principles of Economics*, 6th Ed, Singapore: Pearson Education Pte, Ltd. pp. 75-82, 243-289, 2002.
- [23]. UNDP Human Development Reports 1999.
- [24]. [Online] Available: <http://hdr.undp.org/en/reports/global/hdr1999/>
- [25]. L. S. Chakraborty, Public infrastructure investment and non – market work in India: selective evidence from time use data, New York: Levy Economics Institute of Bard College, 2005.
- [26]. M. Kramer and R. Kakuma, Optimal duration of exclusive breastfeeding, *Cochrane Database Syst Rev*, 2002.
- [27]. [Online] Available: http://en.wikipedia.org/wiki/Breastfeeding#cite_note-Kramer_2002-5
- [28]. S. Hamid, "Women's Non-market work and GDP accounting: The case of Bangladesh" *Research Report Series, BIDS, Dhaka, No. 116*, pp. 12-48, 1989.
- [29]. R. I. Rahman, "Children in economic activity in Bangladesh: Recent changes and determinants" *Bangladesh Institute of Development Studies, Research Report 180*, 2005, pp. 16-23, 25-27, (2005).
- [30]. A. Bayes, and M. Hossain, *Gramermanushgrameenaurthonity: jibonjibikarporibortanporjalochana*, Dhaka: Writers' Foundation, Abdul Azad, Chairman, 2007.
- [31]. J. S. Landefeld, B. M. Fraumeni, and C. M. Vojtech, *Accounting for nonmarket production: a prototype satellite account using the American time use survey*. Boston: The Bureau of Economic Analysis, 2005.
- [32]. UNDP Human Development Reports, 1995. [Online] Available: <http://hdr.undp.org/en/reports/global/hdr1995/>
- [33]. D. N. Gujarati, *Basic Econometrics*, 2nd Ed. New York: McGraw-Hill Book Company. pp. 98-126, 1988.

ENDNOTES:

ⁱ **NMWs**- Someone, regardless of age and sex, is involving in producing goods or services (i.e. generating additional valueⁱ), but the conventional market framework fails to evaluate the value of those goods and services. The recognition of that value/activities/works can be assessed by applying some tools such as opportunity cost, third party criterion, market replacement cost, etc. (Hosen, 2012).

ⁱⁱ **Unpaid**- Due to the lack market framework, most of the people who have been discharging different NMWs finally do not get any return, like money or support (food, shelter, clothes, etc.), (Hosen, 2012).

ⁱⁱⁱ **Underpaid**- A person who produces goods and services or generates values but is not satisfied with the return (monetary and others), or he or she does not feel well by any circumstances such as working environment, low positioned work, lack of job security, etc. (Hosen, 2012).

^{iv} **Circular flow model**: "In the circular flow model, the inter-dependent entities of producer and consumer are referred to as firms and households respectively and provide each other with factors in order to facilitate the flow of income. Firms provide consumers with goods and services in exchange for consumer expenditure and "factors of production" from households" (Mankiw, 2006, pp. 23)

^vThe study (Hosen, 2011).found different variables. To estimate the coefficient under precise economic modes the variables were classified:

a) Dependent variables: Total value NMW for consider OC, monthly (TVNMWOC)

b) Independent variables: 1) House hold no(HH), 2) SEX, male=0,female=1, 3) AGE, 4) Sample area (SAD1), urban=u=1, otherwise=0, (m=0), 5) Sample area (SAD2), rural=r=1, otherwise=0, 6) Family members (FMS), 7) No. of earning member (NEM), 8) Personal income, monthly (PI), 9) Total monthly income of a family (TMIF), 10) Total hours of NMW (HW1*+HW2+HW3) (THNMW), 11) Total estimated NMW, support included, monthly (TENMWM), 12) Estimated total monthly support (FS+SS+CS) (ETMS), 13) Involvement in non market works (INMW), 14) Educational qualification, EQD1:less than primary=1, 0=otherwise, (illiterate=0), (EQD1), 15) Educational qualification, EQD2:primary pass=1, 0=otherwise (EQD2), 16) Educational qualification, EQD3:eight pass=1, 0=otherwise, (EQD3), 17) Educational qualification, EQD4:SSC pass=1, 0=otherwise, (EQD4), 18) Educational qualification, EQD5:HSC pass=1, 0=otherwise, (EQD5), 19) Educational qualification, EQD6: graduate=1, 0=otherwise, (EQD6), 20) Educational qualification, EQD7:masters=1, 0=otherwise, (EQD7), 21) Kinship with the family head, KFHD1: wife=1, otherwise=0 (self=0) (KFHD1), 22) Kinship with the family head, KFHD2: daughter + daughter-in-law=1, otherwise=0 (KFHD2), 23) Kinship with the family head, KFHD3: son=1, otherwise=0 (KFHD3), 24) Kinship with the family head, KFHD4: brother + cousin=1, otherwise=0 (KFHD4), 25) Kinship with the family head, KFHD5: father + father-in-law=1, otherwise=0 (KFHD5), 26) Kinship with the family head, KFHD6: nephew=1, otherwise=0 (KFHD6), 27) Marital status,MSD1: married=m=1, otherwise=0, (um=0) (MSD1), 28) Marital status,MSD2: divorce=1, otherwise=0, widow=3 (MSD2), 29) Marital status,MSD3: widow=1, otherwise=0 um=0, m=1, divorce=2, widow=3 (MSD3), 30) Prime earner, PED1:husband=1, otherwise=0, (self=0) (PED1), 31) Prime earner, PED2:father+father-in-law=1, otherwise=0 (PED2), 32) Prime earner, PED3:elder brother + younger brother + cousin=1, otherwise=0 (PED3), 33) Prime earner, PED4: elder son + son=1, otherwise=0 (PED4), 34) Prime earner,

PED5:mother=1, otherwise=0 (PED5), 35) Family's highest level of education, FHLED1: class 1 to 5=1, otherwise=0 (illiterate=0) (FHLED1), 35) Family's highest level of education, FHLED2: class 6 to 8=1, otherwise=0 (FHLED2), 36) Family's highest level of education, FHLED3: class 9 to SSC=1, otherwise=0 (FHLED3), 37) Family's highest level of education, FHLED4: HSC=1, otherwise=0 (FHLED4), 38) Family's highest level of education, FHLED5: graduate=1, otherwise=0 (FHLED5), 39) Family's highest level of education, FHLED6: masters=1, otherwise=0 (FHLED6), 40) Major profession of the family, MPFD1: Service intensive=1, otherwise=0 (Labor intensive=0) (MPFD1), 41) Major profession of the family, MPFD2: technical=1, otherwise=0 (MPFD2), 42) Employment status, EMSD1: Service provider=1, otherwise=0 (Agri based employed) (EMSD1), 43) Employment status, EMSD2: Entrepreneur =1, otherwise=0 (EMSD2), 44) Employment status, EMSD3: house wife=1, otherwise=0 (EMSD3), 45) Employment status, EMSD4: unemployed=1, otherwise=0 (EMSD4), 46) Employment status, EMSD5: student=1, otherwise=0 (EMSD5), 47) Employment status, EMSD6: underemployed + business look after=1, otherwise=0 (EMSD6).

c) **Dummy variables:** Some independent variables are required to adjust with dummy variables which are:

1. **Sample area:** Three samples are broadly considered as a) Urban area, b) Rural area and c) Mixed area. So two variables are required to adjust.
2. **Sex:** Two categories of sex are male and female.
3. **Educational qualification:** Eight categories are illiterate, less than primary, primary pass, eight pass, SSC pass, HSC pass, graduate, masters.
4. **Kinship with the family head:** Seven types are wife, daughter, son, brother, father, nephew and self.
5. **Marital status:** Four categories are married, unmarried, divorce and widow.
6. **Prime earner:** Six types are self, husband, father, brother, son and mother.
7. **Family's highest level of education:** Seven categories are illiterate, class 1 to 5, class 6 to 8, class 9 to SSC, HSC, graduate and masters.
8. **Major profession of the family:** Three types are labor intensive, service intensive and technical.
9. **Employment status:** Seven categories are agri. based employment, service provider, entrepreneur, house wife, unemployed, student, and underemployed.

^{vi} A transformation process carried use value and exchange value.

^{vii} Titled "REPORT ON MONITORING OF EMPLOYMENT SURVEY-2009 (BBS 2010)" The labor force i.e. economically active population consists of persons (15+) employed for pay or profit during the specified week, plus persons who sought work during that week, the underemployed. All others aged 15 and over are categorized as not in the labor force.

^{viii} **Satellite Accounts:** *Satellite accounts are produced in the context of National Accounts but are more flexible as they allow us to change concepts, definitions, accounting rules and classifications where this would improve analysis,* (Landefeld, et al. 2005). To estimate NMWs, satellite accounts play a significant role. It provides a framework linked to the central accounts and which enables attention to be focused on a certain field or aspect of economic and social life in the context of national accounts. A team of the satellite accounts produces a framework that enables attention to be focused on certain fields or aspects of economic and social life. Satellite accounts can be used to:

- i) Value non-market outputs and inputs
- ii) Present information from National Accounts differently
- iii) Add new information to core accounts
- iv) Experiment with new concepts and methodologies, which may influence the development of national accounts

So, satellite account can make a room to evaluate NMWs, it can be finally incorporated with the National Account in Bangladesh. By applying the methodological frame work researchers can avoid the discrepancies behind to incorporate satellite account in National Account.

^{ix} Monitoring of Employment Survey (MES) – 2009 (for more: Bangladesh Bureau of Statistics (2010). *Report on Monitoring of Employment Survey-2009*. Dhaka: BBS, pp. 6-9.)

^x Labor Force Survey (LFS) – 2005 – 2006 (for more: Bangladesh Bureau of Statistics (2008a). *Key Findings of Labor Force Survey 2005-06*. BBS, Dhaka: Government of the People's Republic of Bangladesh).

^{xi} $TVNMWOC_g = 2042.95 + 1551.46 X_1 = 2042.95 + 1551.46 = \text{Tk. } 3594.41$ per person/ month, (according to dummy variable, EQD6 = 1, recognized graduate level of education).

^{xii} $TVNMWOC_f = 1922.92 + 665.8 X_1 = 1922.92 + 665.8 = \text{Tk. } 2588.72$ per person/month (according to dummy variable, SEX = 1, recognized female).

^{xiii} $TVNMWOC_f = 1766.03 + 700.00 X_1 + 1595.05 X_0 = 2466.03$ per person/month considering female.

^{xiv} $TVNMWOC_g = 1766.03 + 700.00 X_0 + 1595.05 X_1 = 3361.08$ per person/month considered graduate.

^{xv} $TVNMWOC_{f-g} = 1766.03 + 700.00 X_1 + 1595.05 X_1 = 1766.03 + 700.00 + 1595.05 = 4061.08$ per person/month.

-----0000-----